

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-197479

(43)Date of publication of application : 27.07.1999

(51)Int.Cl.

B01F 7/14  
B02C 15/08

(21)Application number : 10-017808

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(22)Date of filing : 14.01.1998

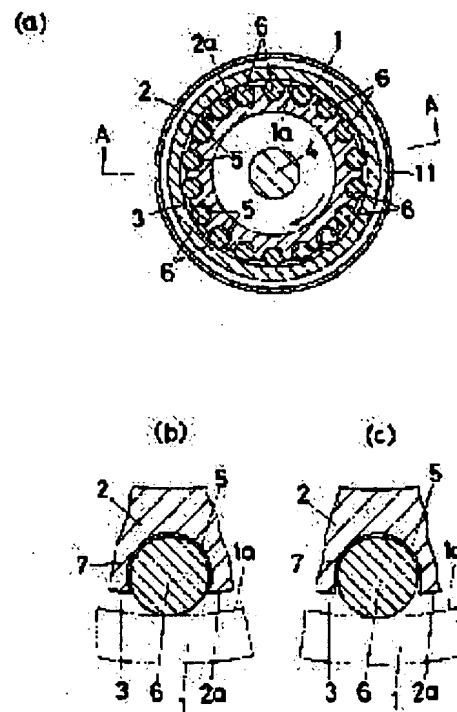
(72)Inventor : KAJIURA SUSUMU

## (54) DISPERSING MACHINE USING ROLLERS

(57)Abstract:

**PROBLEM TO BE SOLVED:** To efficiently produce a fully dispersed mill base without generating a shorth path by uniformly applying compression, shearing and rubbing action to a mill base by a large number of rollers at all places over the whole width in a cylindrical container.

**SOLUTION:** A rotatable rotor 2 is arranged in a cylindrical container 1 in coaxial relation to the container 1 and a large number of grooves 5 parallel to the rotary shaft 4 of the rotor 2 are formed to the outer peripheral part of the rotor 2. Slight gaps 7 are formed at least with respect to the inner walls of the grooves 5 by the centrifugal force caused by the rotation of the rotor 2 and the rollers 6 revolving within the cylindrical container 1 while rotating in contact with the inner wall surface of the cylindrical container 1 are respectively fitted in the grooves 5, 5. A mill base supply port is formed to the cylindrical container 1 on one side thereof and a mill base emitting port is formed thereto on the other side thereof.



## LEGAL STATUS

[Date of request for examination]

06.01.2005

[Date of sending the examiner's decision of

rejection]

[Kind of final disposal of application other than  
the examiner's decision of rejection or  
application converted registration]

[Date of final disposal for application]

[Patent number] 3841949

[Date of registration] 18.08.2006

[Number of appeal against examiner's  
decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

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CLAIMS

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[Claim(s)]

[Claim 1] In the cylinder container 1 which equipped one side with the feed hopper 8 of the mill base, and equipped another side with the delivery 9 of the mill base Arrange Rota 2 pivotable this and in the shape of the same axle, and two or more slots 5 parallel to the revolving shaft 4 are formed in the periphery section of this Rota 2. The disperser using the koro characterized by inserting in the koro 6 which revolves the inside of the cylinder container 1 around the sun while few clearance 7 is formed between the walls of a slot 5 at least with the centrifugal force by rotation of said Rota 2 and rotating in contact with the internal surface of said cylinder container 1 in each slot 5 and 5, respectively.

[Claim 2] The disperser using the koro according to claim 1 by which many slots 5 are arranged at the radial.

[Claim 3] The disperser using the koro according to claim 1 or 2 by which the koro 6 is inserted in crosswise [ of Rota 2 ] by sticking more than one to one slot 5.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a suitable disperser to distribute minutely hyperviscous ingredients (mill base), such as a coating, printing ink, a magnetic coating, and chocolate.

[0002]

[Description of the Prior Art] Although it considers as the disperser which carries out consecutive processing of the hyperviscous mill base and the roll mill and the sand mill are used abundantly, since equipment is open, a solvent etc. disperses and a roll mill also has many losses in worsening an installation environment. Skill is needed also for machine operation. On the other hand, a sand mill can be made into seal structure, actuation is comparatively easy, and the exchange frequency by wear and destruction of tumbling media is high, in a hyperviscous article, a medium focuses on the screen and gap separator which are arranged at the outlet part, and there is also a possibility that operating may become impossible.

[0003] The disperser using the roller and the annular roller as what is replaced with these is also proposed. For example, in JP,5-96197,A, to a tubed container and the revolving shaft arranged in the shape of the same axle, it is movable to the method of the outside of radial, and a roller is supported so that it can rotate, and it distributes by making the inside of a tubed container revolve around the sun, pushing this roller with a centrifugal force at a container internal surface, and rotating. Moreover, in JP,53-3110,B, two or more tapered-roller bearings are arranged in a tubed container, and press in the rolling contact surfaces of rolling element by the rolling motion of a bearing roller distributes.

[0004] However, by neither of the cases, the problem of the so-called short pass passed while the mill base has not fully been processed is not still solved, but the function as a consecutive-processing disperser is fully achieved. for example, while a roller r rotates since this field is very vast although the field which scattered-comes out of in the case of JP,5-96197,A and which is shown in it in drawing 4 is the passage part of the mill base, there are more the amounts which pass while the mill base is unsettled than the amount by which supplementary distribution is carried out by distributed field a' of a container wall by revolving the inside of a container around the sun, and the problem of the so-called short pass which passes while not fully processed arises.

[0005] On the other hand, in the case of JP,53-3110,B which uses tapered-roller bearing, it has the following faults. For example, as shown in drawing 5, when the engine speed of an inner ring of spiral wound gasket b was set to N (r. p.m.) and it calculates as a thing without the skid between an inner ring of spiral wound gasket b and the bearing roller R, the revolution rate of the bearing roller R becomes like a degree type, and the fluidity of the mill base will not go up it considering an apparent rotational speed. The problem of the so-called short pass passed as this result while the mill base has not fully been processed arises.

[0006]

[Equation 1]

$$\frac{d}{D} \times N \quad r. p. m.$$

(They are the outer diameter of the d:inner ring of spiral wound gasket b, and the bore of the D:outer ring of spiral wound gasket B here)

[0007] And although retainer R' for holding the bearing roller R is required in this case, since there is this retainer R', a flow of the mill base will be checked remarkably, and equalization of the mill base will be barred. Furthermore, since a clearance is surely generated among the adjoining bearing rollers R and R even if it sticks bearing to a revolving shaft and attaches it, among the bearing rollers R and R, attachment effectiveness is not only bad, but produces the situation where the mill base is not distributed. Thus, in the case of JP,5-96197,A or JP,53-3110,B, it is clear that the problem of the so-called short pass passed while the mill base has not fully been processed at least arises, and the function as a consecutive-processing disperser is not fully achieved. This invention aims at offering the disperser which can cancel this fault.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, in this invention, to one side the feed hopper 8 of the mill base in the cylinder container 1 which is equipped another side with the delivery 9 of the mill base, Rota 2 pivotable this and in the shape of the same axle is arranged. Two or more slots 5 parallel to the revolving shaft 4 are formed in the periphery section of this Rota 2. In each slot 5 and 5 The koro 6 which revolves the inside of the cylinder container 1 around the sun is inserted in, respectively, few clearance 7 being formed between the walls of said slot 5 at least with the centrifugal force by rotation of said Rota 2, and rotating in contact with the internal surface of said cylinder container 1.

[0009] If Rota 2 rotates within the cylinder container 1, while each slot 5 of Rota 2 and the koro 6 and 6 inserted in in five are in contact with the internal surface of the cylinder container 1 at least with the centrifugal force and a gap also rotates, the inside of the cylinder container 1 will be revolved around the sun. And the mill base compulsorily fed in the cylinder container 1 from the feed hopper 8 is pushed against the internal surface of the cylinder container 1 by these koro 6 and 6, repeats compression and a shear operation, is extruded with a receptacle to a delivery 9, and is breathed out from a delivery 9.

[0010] By the way, in this invention, since the koro 6 is inserted into the slot 5 of Rota 2, the rotational frequency of Rota 2 serves as a revolution rate of the koro 6. Therefore, with the mighty centrifugal force by rotation of Rota 2, while the mill base is strongly pushed to the internal surface of the cylinder container 1, it will be strongly pushed to the internal surface of the cylinder container 1 by each koro 6 and 6, and compression and a shear operation will be repeated and received.

[0011] in this case, the field through which the mill base passes -- the internal surface of the cylinder container 1 -- it is limited very much to the neighborhood. When it puts in another way, as shown in drawing 3, clearance 3 part which it is between the internal surface of the cylinder container 1 and the peripheral face of Rota 2 is the passage field of the mill base. And in this invention, the liquid flow phenomenon of the mill base as always shown by the arrow head of drawing 3 according to a stirring operation of Rota 2 arises in this specific region. Consequently, it will be made to always circulate through the mill base in this specific region, and homogeneity will distribute.

[0012] Furthermore, as shown in drawing 3, since few clearance 7 is formed between the wall of a slot 5, and the peripheral face of the koro 6 of the centrifugal force by rotation of a rotor 2, the mill base also enters this clearance 7 and the koro 6 which rotates in a slot 5 receives a powerful grinding operation also here. Thus, in this invention, the mill base will receive compression, a shear, and a grinding operation uniformly in all the locations in the cylinder container 1. Therefore, the mill base distributed by homogeneity can be manufactured, without causing a short pass.

[0013] As for a slot 5, it is desirable that a large number are arranged at the radial. When many slots 5 are arranged at the radial, the mill base will receive compression, a shear, and a grinding operation more uniformly by many slots 5 and the koro 6 and 6 inserted in in five, respectively. Therefore, the mill base distributed more by homogeneity can be obtained.

[0014] As for the koro 6, it is desirable to stick more than one crosswise [ of Rota 2 ], and to be inserted in it to one slot 5. If the koro 6 sticks more than one crosswise [ of Rota 2 ] and is inserted in it to one slot 5, the whole internal surface of the cylinder container 1 can be made into a distributed field. And each koro 6 and 6 inserted in in one slot 5 rotates independently, respectively. Therefore, the mill base receives the compression which became independent over the whole internal surface of the cylinder container 1, respectively by each koro 6 and 6, a shear, and a grinding operation. Consequently, the mill base distributed more than enough can be obtained.

[0015]

[Embodiment of the Invention] The gestalt of most desirable operation of this invention is explained to a detail based on a drawing. In the cylinder container 1, Rota 2 pivotable this and in the shape of the same axle is arranged. Between internal-surface 1a of the cylinder container 1, and peripheral face 2a of Rota 2, it is drawing 1 (b). (c) And as shown in drawing 3, only the clearance 3 which may pass the mill base is formed. On the other hand, the rotation drive of Rota 2 is made to be carried out in a direction by rotating the revolving shaft 4 by the source of power which is not illustrated, as the arrow head of drawing 2 shows. The koro 6 which revolves the inside of the cylinder container 1 around the sun is inserted in, respectively, forming two or more slots 5 parallel to that revolving shaft 4 in the periphery section of this Rota 2, and few clearance 7 between the walls of said slot 5 being formed at least with the centrifugal force by rotation of said Rota 2 in each slot 5 and 5, and rotating in contact with the internal surface of said cylinder container 1. In addition, the both ends of the cylinder container 1 are closed by the disc-like cover board shown with the drawing signs 1b and 1c in drawing 2 so that dedropping [ the koro 6 fang furrow 5 to ] may not be found.

[0016] As for the magnitude of the koro 6, it is desirable to consider as the path of extent which touches mostly internal-surface 1a of the cylinder container 1, being mostly inscribed in a slot 5. If the koro 6 is made into magnitude of this level, the inside of the cylinder container 1 can be revolved around the sun, few clearance 7 being formed between the peripheral faces of the wall of said slot 5, and the koro 6 at least with the centrifugal force by rotation of Rota 2, and rotating in contact with the internal surface of said cylinder container 1 (refer to drawing 1 (b), (c), and drawing 3 ). Although the form inserted in one to one slot 5 is sufficient as this koro 6, as shown in drawing 2, it is desirable to the cross direction in Rota 2 that two or more insertion is carried out. On the other hand, a slot 5 is drawing 1 (a), although two or more formation should just be practically carried out to Rota 2. It is most desirable that a large number are formed in a radial so that it may be shown. Moreover, the cross-section configuration of a slot 5 is drawing 1 (b). It is good also as an abbreviation C typeface so that it may be shown, and it is drawing 1 (c). It is good also as an abbreviation U typeface so that it may be shown.

[0017] This can call it the most desirable gestalt of this invention. When this disperser is used, the mill base will receive compression, a shear, and a grinding operation uniformly by many koro 6 and 6 in all the locations covering the whole width of face in the cylinder container 1. Therefore, the mill base distributed more than enough can be manufactured well, without causing a short pass.

[0018] The delivery 9 for the feed hopper 8 for supplying the mill base to make another side breathing out the mill base is formed in one side of the cylinder container 1. When shown in drawing 2, a feed hopper 8 is formed in the lower limit section, and the delivery 9 is formed in the up side. The mill base is supplied from the lower part as a vertical mold as shown in drawing 2, it is rare for the direction made to breathe out from the up side to inhale air, and it does not have to carry out degassing actuation after distributed processing. But contrary to the case of drawing 2, a feed hopper is formed in the up side, a delivery is formed in the lower limit section, the mill base is supplied from the up side, and you may make it make it breathe out from the lower limit section. Moreover, the equipment shown in drawing 2 can also be used as a horizontal type.

[0019] On the other hand, in order to make the whole disperser including the cylinder container 1 into seal structure, also as for a revolving shaft 4, it is desirable that it takes shaft-seal 10 ( drawing 2 ). In addition, the member ( drawing 2 ) to which each part material attached x mark in the rectangular head in the part to join [ each other ] is a seal member. It is desirable to form the jacket 11 ( drawing 1 (a) and drawing 2 ) which may make the periphery of the cylinder container 1 pass cooling water, or hot water

and warm water. If this jacket 11 is formed, when cooling water, or hot water and warm water passes through the inside of this, the mill base can be cooled or it can warm. In addition, it sets to drawing 2 and is drawing sign 11a. A jacket inlet port and 11b It is a jacket outlet. In addition, if the cylinder container 1, Rota 2, and the koro 6 are produced by ceramic material, such as a superhard ingredient and a zirconia, sialon, those abrasion resistance can be raised.

[0020] The space volume of a container and the amount of the disperser illustrated as most desirable gestalt here which remains in a container since it is comparatively small decrease so much. Therefore, there are also so few losses, and since structure is also easy, washing is also easy. Moreover, it writes as seal structure, and there is also little scattering of a solvent and it does not need management of a dispersion-medium object, and exchange like the conventional sand mill. Therefore, it not only hardly needs a maintenance, but in case the hyperviscous mill base is processed, it does not cause trouble to operation.

[0021]

[Effect of the Invention] When a disperser according to claim 1 is used, it is effective in the ability to manufacture the mill base distributed by homogeneity, without causing a short pass.

[0022] When a disperser according to claim 2 is used, it is effective in the ability to obtain the mill base distributed more by homogeneity.

[0023] When a disperser according to claim 3 is used, it is effective in the ability to obtain the mill base distributed more than enough.

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TECHNICAL FIELD

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[Field of the Invention] This invention relates to a suitable disperser to distribute minutely hyperviscous ingredients (mill base), such as a coating, printing ink, a magnetic coating, and chocolate.

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EFFECT OF THE INVENTION

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## TECHNICAL PROBLEM

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[Description of the Prior Art] Although it considers as the disperser which carries out consecutive processing of the hyperviscous mill base and the roll mill and the sand mill are used abundantly, since equipment is open, a solvent etc. disperses and a roll mill also has many losses in worsening an installation environment. Skill is needed also for machine operation. On the other hand, a sand mill can be made into seal structure, actuation is comparatively easy, and the exchange frequency by wear and destruction of tumbling media is high, in a hyperviscous article, a medium focuses on the screen and gap separator which are arranged at the outlet part, and there is also a possibility that operating may become impossible.

[0003] The disperser using the roller and the annular roller as what is replaced with these is also proposed. For example, in JP,5-96197,A, to a tubed container and the revolving shaft arranged in the shape of the same axle, it is movable to the method of the outside of radial, and a roller is supported so that it can rotate, and it distributes by making the inside of a tubed container revolve around the sun, pushing this roller with a centrifugal force at a container internal surface, and rotating. Moreover, in JP,53-3110,B, two or more tapered-roller bearings are arranged in a tubed container, and press in the rolling contact surfaces of rolling element by the rolling motion of a bearing roller distributes.

[0004] However, by neither of the cases, the problem of the so-called short pass passed while the mill base has not fully been processed is not still solved, but the function as a consecutive-processing disperser is fully achieved. for example, while a roller r rotates since this field is very vast although the field which scattered-comes out of in the case of JP,5-96197,A and which is shown in it in drawing 4 is the passage part of the mill base, there are more the amounts which pass while the mill base is unsettled than the amount by which supplementary distribution is carried out by distributed field a' of a container wall by revolving the inside of a container around the sun, and the problem of the so-called short pass which passes while not fully processed arises.

[0005] On the other hand, in the case of JP,53-3110,B which uses tapered-roller bearing, it has the following faults. For example, as shown in drawing 5, when the engine speed of an inner ring of spiral wound gasket b was set to N (r. p.m.) and it calculates as a thing without the skid between an inner ring of spiral wound gasket b and the bearing roller R, the revolution rate of the bearing roller R becomes like a degree type, and the fluidity of the mill base will not go up it considering an apparent rotational speed. The problem of the so-called short pass passed as this result while the mill base has not fully been processed arises.

[0006]

[Equation 1]

$$\frac{d}{D} \times N \quad \text{r. p. m.}$$

(They are the outer diameter of the d:inner ring of spiral wound gasket b, and the bore of the D:outer ring of spiral wound gasket B here)

[0007] And although retainer R' for holding the bearing roller R is required in this case, since there is

this retainer R', a flow of the mill base will be checked remarkably, and equalization of the mill base will be barred. Furthermore, since a clearance is surely generated among the adjoining bearing rollers R and R even if it sticks bearing to a revolving shaft and attaches it, among the bearing rollers R and R, attachment effectiveness is not only bad, but produces the situation where the mill base is not distributed. Thus, in the case of JP,5-96197,A or JP,53-3110,B, it is clear that the problem of the so-called short pass passed while the mill base has not fully been processed at least arises, and the function as a consecutive-processing disperser is not fully achieved. This invention aims at offering the disperser which can cancel this fault.

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MEANS

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[Means for Solving the Problem] In order to attain the above-mentioned purpose, in this invention, to one side the feed hopper 8 of the mill base In the cylinder container 1 which equipped another side with the delivery 9 of the mill base, Rota 2 pivotable this and in the shape of the same axle is arranged. Two or more slots 5 parallel to the revolving shaft 4 are formed in the periphery section of this Rota 2. In each slot 5 and 5 The koro 6 which revolves the inside of the cylinder container 1 around the sun is inserted in, respectively, few clearance 7 being formed between the walls of said slot 5 at least with the centrifugal force by rotation of said Rota 2, and rotating in contact with the internal surface of said cylinder container 1.

[0009] If Rota 2 rotates within the cylinder container 1, while each slot 5 of Rota 2 and the koro 6 and 6 inserted in in five are in contact with the internal surface of the cylinder container 1 at least with the centrifugal force and a gap also rotates, the inside of the cylinder container 1 will be revolved around the sun. And the mill base compulsorily fed in the cylinder container 1 from the feed hopper 8 is pushed against the internal surface of the cylinder container 1 by these koro 6 and 6, repeats compression and a shear operation, is extruded with a receptacle to a delivery 9, and is breathed out from a delivery 9.

[0010] By the way, in this invention, since the koro 6 is inserted into the slot 5 of Rota 2, the rotational frequency of Rota 2 serves as a revolution rate of the koro 6. Therefore, with the mighty centrifugal force by rotation of Rota 2, while the mill base is strongly pushed to the internal surface of the cylinder container 1, it will be strongly pushed to the internal surface of the cylinder container 1 by each koro 6 and 6, and compression and a shear operation will be repeated and received.

[0011] in this case, the field through which the mill base passes -- the internal surface of the cylinder container 1 -- it is limited very much to the neighborhood. When it puts in another way, as shown in drawing 3, clearance 3 part which it is between the internal surface of the cylinder container 1 and the peripheral face of Rota 2 is the passage field of the mill base. And in this invention, the liquid flow phenomenon of the mill base as always shown by the arrow head of drawing 3 according to a stirring operation of Rota 2 arises in this specific region. Consequently, it will be made to always circulate through the mill base in this specific region, and homogeneity will distribute.

[0012] Furthermore, as shown in drawing 3, since few clearance 7 is formed between the wall of a slot 5, and the peripheral face of the koro 6 of the centrifugal force by rotation of a rotor 2, the mill base also enters this clearance 7 and the koro 6 which rotates in a slot 5 receives a powerful grinding operation also here. Thus, in this invention, the mill base will receive compression, a shear, and a grinding operation uniformly in all the locations in the cylinder container 1. Therefore, the mill base distributed by homogeneity can be manufactured, without causing a short pass.

[0013] As for a slot 5, it is desirable that a large number are arranged at the radial. When many slots 5 are arranged at the radial, the mill base will receive compression, a shear, and a grinding operation more uniformly by many slots 5 and the koro 6 and 6 inserted in in five, respectively. Therefore, the mill base distributed more by homogeneity can be obtained.

[0014] As for the koro 6, it is desirable to stick more than one crosswise [ of Rota 2 ], and to be inserted in it to one slot 5. If the koro 6 sticks more than one crosswise [ of Rota 2 ] and is inserted in it to one

slot 5, the whole internal surface of the cylinder container 1 can be made into a distributed field. And each koro 6 and 6 inserted in in one slot 5 rotates independently, respectively. Therefore, the mill base receives the compression which became independent over the whole internal surface of the cylinder container 1, respectively by each koro 6 and 6, a shear, and a grinding operation. Consequently, the mill base distributed more than enough can be obtained.

[0015]

[Embodiment of the Invention] The gestalt of most desirable operation of this invention is explained to a detail based on a drawing. In the cylinder container 1, Rota 2 pivotable this and in the shape of the same axle is arranged. Between internal-surface 1a of the cylinder container 1, and peripheral face 2a of Rota 2, it is drawing 1 (b). (c) And as shown in drawing 3, only the clearance 3 which may pass the mill base is formed. On the other hand, the rotation drive of Rota 2 is made to be carried out in a direction by rotating the revolving shaft 4 by the source of power which is not illustrated, as the arrow head of drawing 2 shows. The koro 6 which revolves the inside of the cylinder container 1 around the sun is inserted in, respectively, forming two or more slots 5 parallel to that revolving shaft 4 in the periphery section of this Rota 2, and few clearance 7 between the walls of said slot 5 being formed at least with the centrifugal force by rotation of said Rota 2 in each slot 5 and 5, and rotating in contact with the internal surface of said cylinder container 1. In addition, the both ends of the cylinder container 1 are closed by the disc-like cover board shown with the drawing signs 1b and 1c in drawing 2 so that dedropping [ the koro 6 fang furrow 5 to ] may not be found.

[0016] As for the magnitude of the koro 6, it is desirable to consider as the path of extent which touches mostly internal-surface 1a of the cylinder container 1, being mostly inscribed in a slot 5. If the koro 6 is made into magnitude of this level, the inside of the cylinder container 1 can be revolved around the sun, few clearance 7 being formed between the peripheral faces of the wall of said slot 5, and the koro 6 at least with the centrifugal force by rotation of Rota 2, and rotating in contact with the internal surface of said cylinder container 1 (refer to drawing 1 (b), (c), and drawing 3). Although the form inserted in one to one slot 5 is sufficient as this koro 6, as shown in drawing 2, it is desirable to the cross direction in Rota 2 that two or more insertion is carried out. On the other hand, a slot 5 is drawing 1 (a), although two or more formation should just be practically carried out to Rota 2. It is most desirable that a large number are formed in a radial so that it may be shown. Moreover, the cross-section configuration of a slot 5 is drawing 1 (b). It is good also as an abbreviation C typeface so that it may be shown, and it is drawing 1 (c). It is good also as an abbreviation U typeface so that it may be shown.

[0017] This can call it the most desirable gestalt of this invention. When this disperser is used, the mill base will receive compression, a shear, and a grinding operation uniformly by many koro 6 and 6 in all the locations covering the whole width of face in the cylinder container 1. Therefore, the mill base distributed more than enough can be manufactured well, without causing a short pass.

[0018] The delivery 9 for the feed hopper 8 for supplying the mill base to make another side breathing out the mill base is formed in one side of the cylinder container 1. When shown in drawing 2, a feed hopper 8 is formed in the lower limit section, and the delivery 9 is formed in the up side. The mill base is supplied from the lower part as a vertical mold as shown in drawing 2, it is rare for the direction made to breathe out from the up side to inhale air, and it does not have to carry out degassing actuation after distributed processing. But contrary to the case of drawing 2, a feed hopper is formed in the up side, a delivery is formed in the lower limit section, the mill base is supplied from the up side, and you may make it make it breathe out from the lower limit section. Moreover, the equipment shown in drawing 2 can also be used as a horizontal type.

[0019] On the other hand, in order to make the whole disperser including the cylinder container 1 into seal structure, also as for a revolving shaft 4, it is desirable that it takes shaft-seal 10 ( drawing 2 ). In addition, the member ( drawing 2 ) to which each part material attached x mark in the rectangular head in the part to join [ each other ] is a seal member. It is desirable to form the jacket 11 ( drawing 1 (a) and drawing 2 ) which may make the periphery of the cylinder container 1 pass cooling water, or hot water and warm water. If this jacket 11 is formed, when cooling water, or hot water and warm water passes through the inside of this, the mill base can be cooled or it can warm. In addition, it sets to drawing 2

and is drawing sign 11a. A jacket inlet port and 11b It is a jacket outlet. In addition, if the cylinder container 1, Rota 2, and the koro 6 are produced by ceramic material, such as a superhard ingredient, and a zirconia, sialon, those abrasion resistance can be raised.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the crossing schematic diagram showing most desirable example of the disperser by this invention, among those (a) is general drawing and (b). (c) The configuration of the slot currently formed in the periphery section of Rota is expanded and shown with the koro.

[Drawing 2] It is drawing of longitudinal section of the whole disperser in the A-A part of drawing 1 .

[Drawing 3] It is the expansion cross-sectional view showing signs that the mill base is distributed in a detail by the disperser shown in drawing 1 .

[Drawing 4] It is the principle Fig. showing the fault of the conventional disperser using a roller.

[Drawing 5] It is the principle Fig. showing the fault of the conventional disperser using tapered-roller bearing.

[Description of Notations]

1 - cylinder container, a 1a - internal surface, 1b, a 1c - cover board, 2 - Rota, a 2a - peripheral face, 3 - clearance, 4 - revolving shaft, 5 - slots, 6 - koro, 7 - clearance, 8 - feed hopper, 9 - delivery, 10 - jacket, a 10a - jacket inlet port, a 10b - jacket outlet, r - roller, b - inner ring of spiral wound gasket, B - outer ring of spiral wound gasket, R - bearing roller, an R' - retainer.

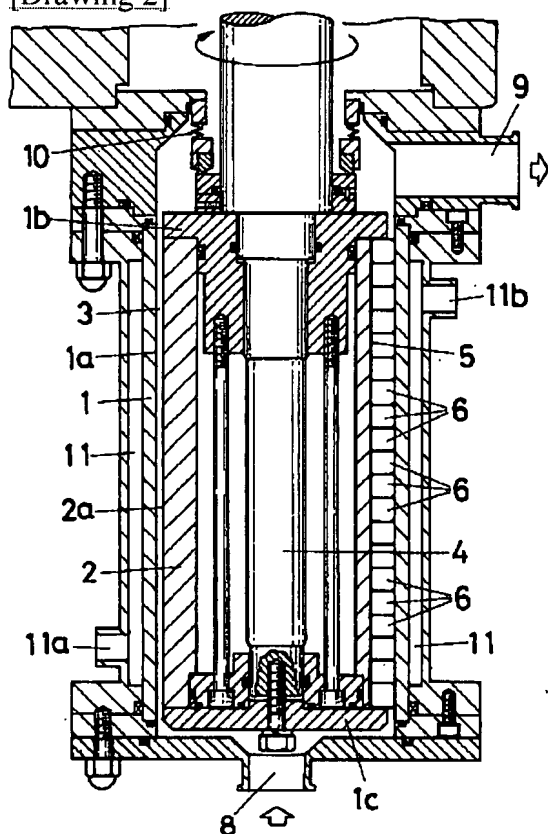
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[Translation done.]

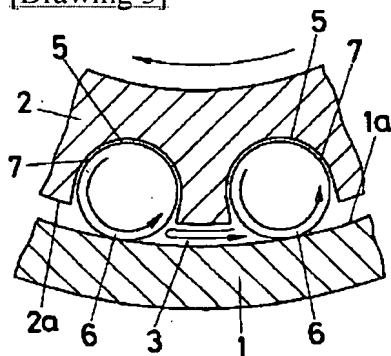
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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

[Drawing 2]

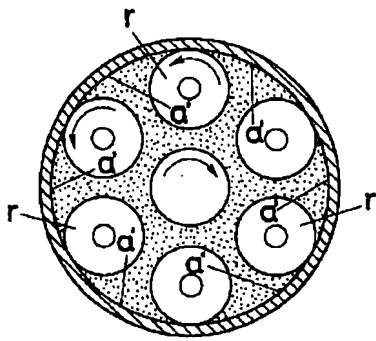


[Drawing 3]



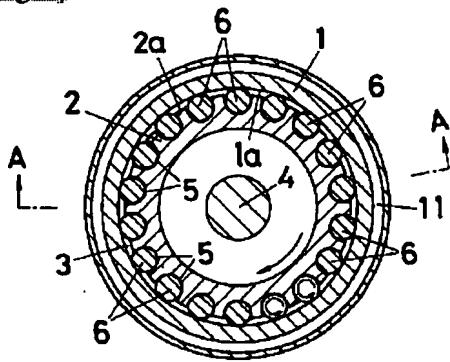
[Drawing 4]



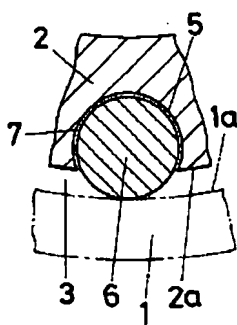


[Drawing 1]

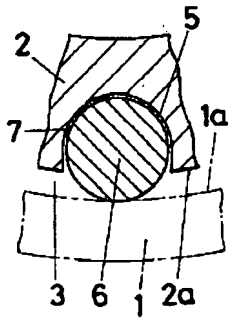
(a)



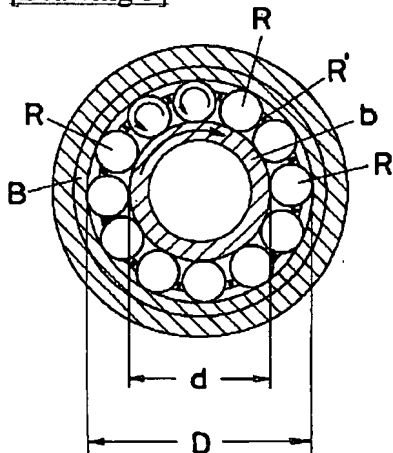
(b)



(c)



[Drawing 5]



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[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開

特開平11-

(43) 公開日 平成11年(1

(51) Int. Cl.<sup>6</sup>

識別記号

F I

B 0 1 F 7/14

B 0 1 F 7/14

B 0 2 C 15/08

B 0 2 C 15/08

B

審査請求 未請求 請求項の数 3 F D

(21) 出願番号

特願平10-17808

(22) 出願日

平成10年(1998) 1月14日

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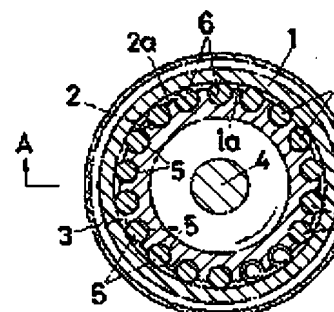
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(54) 【発明の名称】 コロを用いた分俵機

(57) 【要約】

【解決手段】円筒容器1内に、これと同軸状に回転可能なロータ2を配置する。このロータ2の外周部にその回転軸4と平行な溝5を多数形成する。各溝5、5内に、前記ロータ2の回転による遠心力で少なくとも溝5の内壁との間にわずかな隙間7が形成され、かつ、前記円筒容器1の内壁面に当接して自転しながら円筒容器1内を公転するコロ6をそれぞれ装入する。円筒容器1の一方にミルベースの供給口8を、他方にミルベースの吐出口9を形成する。

(a)



(2)

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## 【特許請求の範囲】

【請求項 1】一方にミルベースの供給口 8 を、他方にミルベースの吐出口 9 を備えた円筒容器 1 内に、これと同軸状に回転可能なロータ 2 を配置し、該ロータ 2 の外周部にその回転軸 4 と平行な溝 5 を複数形成し、各溝 5、5 内に、前記ロータ 2 の回転による遠心力で少なくとも溝 5 の内壁との間にわずかなすきま 7 が形成され、かつ、前記円筒容器 1 の内壁面に当接して自転しながら円筒容器 1 内を公転するコロ 6 をそれぞれ装したことを特徴とするコロを用いた分散機。

【請求項 2】溝 5 が放射状に多数配置されている請求項 1 記載のコロを用いた分散機。

【請求項 3】コロ 6 が 1 つの溝 5 に対してロータ 2 の幅方向に複数密着して装入されている請求項 1 又は 2 記載のコロを用いた分散機。

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、塗料、印刷インキ、磁性塗料、チョコレート等の高粘度材料（ミルベース）を微細に分散させるのに好適な分散機に関するものである。

【0002】

【従来の技術、発明が解決しようとする課題】高粘度ミルベースを連続処理する分散機として、ロールミルやサンドミルが多用されているが、ロールミルは装置が開放的であるために溶媒等が飛散して設置環境を悪くしたり、ロスも多い。機械操作にも熟練を必要とする。一方、サンドミルは密封構造とすることができ、操作も比較的簡単であるが、粉砕媒体の摩耗や破壊による交換頻度が高く、高粘度品では出口部分に配置されているスクリーンやギャップセパレータに媒体が集中し、運転不能となるおそれもある。

【0003】これらに代わるものとして、ローラや環状ローラを用いた分散機も提案されている。例えば、特開平 5 - 9 6 1 9 7 号では、筒状容器と同軸状に配置した回転軸に、半径方向外方に移動可能で、かつ自転可能なようにローラを支持し、このローラを遠心力で容器内壁面に押し付けて自転しながら筒状容器内を公転させることにより分散を行う。また、特公昭 5 3 - 3 1 1 0 号では、筒状容器内に複数のテーパローラベアリングを配

a' で補足分散される量よりもミルベースが通過してしまう量の方が多く、充分に処理通過してしまう、いわゆるショートパス（る）。

【0005】一方、テーパローラベアリングの特公昭 5 3 - 3 1 1 0 号の場合には、点を有する。例えば、図 5 に示すように、数を  $N(r.p.m.)$  とすると、内輪  $r$  とベアリング間でのすべりが無いものとして計算した、グローラ  $R$  の公転速度は次式のように、転速度の割りにはミルベースの流動性がある。この結果として、ミルベースが充ていまま通過してしまう、いわゆるショート生じる。

【0006】

【数 1】

$$\frac{d}{D} \times N \quad r.p.m.$$

（ここに、 $d$ ：内輪  $r$  の外径、 $D$ ：外輪

【0007】そして、この場合には、ベアリング  $R$  を保持するためのリテーナ  $R'$  が必要。リテーナ  $R'$  があるためにミルベースの損傷され、ミルベースの均一化が妨げられ、さらに、ベアリングを回転軸に密着させても、隣接するベアリングローラ  $R$ 、 $R$  間が生じるため、取付効率が悪いだけで、グローラ  $R$ 、 $R$  間ではミルベースが分散状態を生じる。このように、特開平 5 - 9 6 1 9 7 号の場合には、少くもミルベースが充分に処理されないまま通過しているショートパスの問題が生じることが明らか。本発明は、この欠点を解消することができ、することを目的とするものである。

【0008】

【課題を解決するための手段】上記目的に、本発明では、一方にミルベースの供給にミルベースの吐出口 9 を備えた円筒容器と同軸状に回転可能なロータ 2 を配置し、外周部にその回転軸 4 と平行な溝 5 を複

(3)

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3

4

ースは、このコロ6、6により円筒容器1の内壁面に押し付けられ、圧縮、剪断作用を繰り返しながら吐出口9へと押し出され、吐出口9から吐出される。

【0010】ところで、本発明においては、コロ6がロータ2の溝5内に挿入されているから、ロータ2の回転数がコロ6の公転速度となる。従って、ロータ2の回転による強大な遠心力でミルベースは円筒容器1の内壁面に強く押し付けられるとともに、各コロ6、6によっても円筒容器1の内壁面に強く押し付けられることになり、圧縮、剪断作用を繰り返して受けることになる。

【0011】この場合において、ミルベースが通過する領域は円筒容器1の内壁面のごく近辺に限定される。換言すると、図3に示すように、円筒容器1の内壁面とロータ2の外周面との間であるすきま3部分がミルベースの通過領域である。そして、本発明では、この特定領域において、ロータ2の攪拌作用により常に図3の矢印で示すようなミルベースの液流れ現象が生じる。この結果、ミルベースはこの特定領域において常に循環せしめられ、均一に分散されることになる。

【0012】さらに、図3に示すように、ロータ2の回転による遠心力により、溝5の内壁とコロ6の外周面との間にわずかなすきま7が形成されるから、このすきま7にもミルベースが入り込み、溝5内で回転するコロ6によりここでも強力なすり作用を受ける。このように、本発明では、円筒容器1内のあらゆる場所で、ミルベースが満遍無く圧縮、剪断、すり作用を受けることになる。従って、ショートバスを起こすことなく均一に分散されたミルベースを製造することができる。

【0013】溝5は放射状に多数配置されているのが好ましい。溝5が放射状に多数配置されていると、多数の溝5、5内にそれぞれ装入されているコロ6、6により、ミルベースがより満遍無く圧縮、剪断、すり作用を受けることになる。従って、より均一に分散されたミルベースを得ることができる。

【0014】コロ6は1つの溝5に対してロータ2の幅方向に複数密着して装入されているのが好ましい。コロ6が1つの溝5に対してロータ2の幅方向に複数密着して装入されていると、円筒容器1の内壁面全体を分散領域とすることができる。そして、1つの溝5内に装入されている各コロ6、6がそれぞれ独立して回転する。従

させ得るだけのすきま3を形成する。ロ、  
してない動力源によりその回転軸4を例、  
で示すように回転させることにより、一、  
動されるようにする。このロータ2の外、  
軸4と平行な溝5を複数形成し、各溝5、  
ータ2の回転による遠心力で少なくとも、  
との間にわずかなすきま7が形成され、  
容器1の内壁面に当接して自転しながら、  
公転するコロ6をそれぞれ装入する。な、

5から脱落しないように、図2において、  
で示す円板状の覆板で円筒容器1の両端、

【0016】コロ6の大きさは、溝5に、  
ら円筒容器1の内壁面1aにほぼ接する程、  
が好ましい。コロ6をこの程度の大きさ、  
ロータ2の回転による遠心力で少なくと、  
壁とコロ6との外周面との間にわずかな、  
され、かつ、前記円筒容器1の内壁面に、  
ながら円筒容器1内を公転することがで、

、(c)、及び、図3参照)。このコロ6  
に対して1つ装入されている形でもよい、  
ように、ロータ2の幅方向に複数装入さ、  
ましい。一方、溝5は、実用上はロータ、  
形成されておればよいが、図1(a)に示、  
に多数形成されているのが最も好ましい。  
断面形状は、図1(b)に示すように略C、  
く、また、図1(c)に示すように略U字、  
い。

【0017】これが本発明の最も好まし、  
とができる。この分散機を用いた場合に、  
内の幅全体にわたるあらゆる場所で、多、  
によりミルベースが満遍無く圧縮、剪断、  
けることになる。従って、ショートバス、  
く十二分に分散されたミルベースを能率、  
とができる。

【0018】円筒容器1の一方にはミル、  
るための供給口8が、他方にはミルベ、  
ための吐出口9が形成されている。図2、  
は、下端部に供給口8が、上部側方に吐、  
れている。図2に示すような縦型として、  
部から供給し、上部側方から吐出させる。

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である。円筒容器1の外周に、冷却水あるいは熱水・温水を通過させ得るジャケット11(図1(a)、図2)を形成するのが好ましい。このジャケット11が形成されていると、冷却水あるいは熱水・温水がこの中を通過することによってミルベースを冷却したり、加温することができる。なお、図2において、図面符号11aはジャケット入口、11bはジャケット出口である。なお、円筒容器1、ロータ2、コロ6を超硬材料やジルコニア、サイアロン等のセラミックス材で作製すると、それらの耐摩耗性を向上させることができる。

【0020】最も好ましい形態としてここに例示した分散機は、容器の空間容積も比較的小さいため、容器内に残留する量もそれだけ少なくなる。従って、ロスもそれだけ少なく、構造も簡単であるから洗浄も容易である。また、密封構造としたため、溶媒の飛散も少なく、従来のサンドミルの様に分散媒体の管理、交換を必要としない。従って、メンテナンスをほとんど必要としないだけでなく、高粘度のミルベースを処理する際も運転に支障を来すこともない。

【0021】

【発明の効果】請求項1記載の分散機を用いた場合には、ショートパスを起こすことなく均一に分散されたミルベースを製造することができる効果がある。

【0022】請求項2記載の分散機を用いた場合には、より均一に分散されたミルベースを得ることができる効果

\* 果がある。

【0023】請求項3記載の分散機を用いた場合には、十二分に分散されたミルベースを得ることができる。

【図面の簡単な説明】

【図1】本発明による分散機の最も好ましい実施形態の横断概略図で、そのうち、(a)は全体図、ロータの外周部に形成されている溝の形状に拡大して示すものである。

10 【図2】図1のA-A部分における分散機の横断図である。

【図3】図1に示す分散機により、ミルベースの様子を詳細に示す拡大横断面図である。

【図4】ローラを用いた従来の分散機の横断図である。

【図5】テーパローラベアリングを用いた分散機の欠点を示す原理図である。

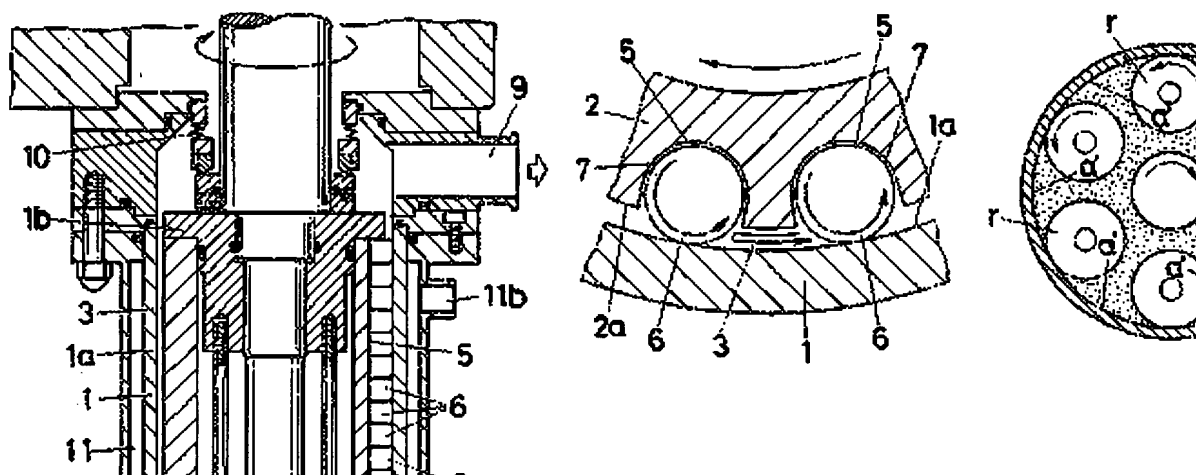
【符号の説明】

1—円筒容器、1a—内壁面、1b、1c—覆  
20 タ、2a—外周面、3—すきま、4—回転  
—コロ、7—すきま、8—供給口、9—  
ジャケット、10a—ジャケット入口、10b—  
口、r—ローラ、b—内輪、B—外輪、  
ローラ、R—リテーナ。

【図2】

【図3】

【図4】



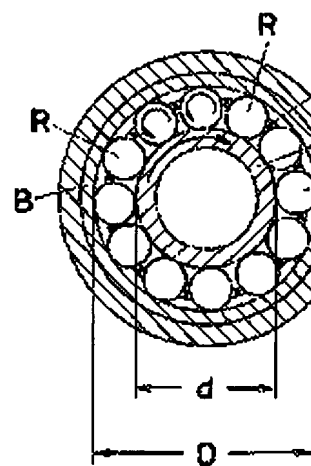
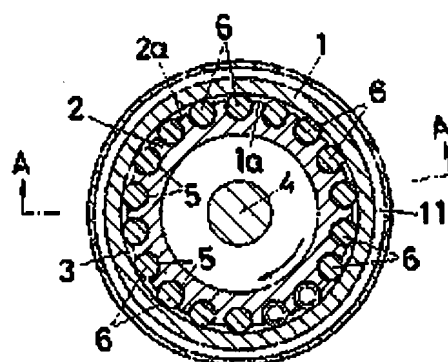
(5)

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【図 1】

【図 5】

(a)



(b)

(c)

